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ABSTRACT

The crisis in health care is one of the lack of delivery of health services to the consumer. This is, in part, secondary to the dearth and maldistribution of primary care physicians and the ineffective utilization of existing health manpower to deliver primary care. Physician's assistants and the expanded role of nurses in patient care as nurse associates are two answers to this dilemma. There are now over 82 programs at various stages of development which involve these manpower categories, with 70 percent of these programs designed to train primary care personnel. Five national professional organizations have established guidelines for the training of physician's assistants or nurse associates, and efforts are under way on a national scale to standardize programs by accreditation and to certify graduates. The Federal expenditure for physicians assistant and nurse associate programs is large in relation to all categories of allied health personnel, and it is increasing. Several medical-legal problems are under study and are being resolved. There is much positive data about the acceptance of physician's assistants and nurse associates by physicians and patients and about the effect assistants and associates have on productivity of health systems and quality of health services. (Author)

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A REVIEW

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PHYSICIAN'S ASSISTANTS AND NURSE ASSOCIATES: A REVIEW

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I. ABSTRACT

The crisis in health care is one of the lack of delivery of health services to the consumer. This is, in part, secondary to a dearth of, and maldistribution of, primary care physicians and the ineffective utilization of existing health manpower to deliver primary care. Physician's assistants and the expanded role of nurses in patient care as nurse associates are two answers to this dilemma. There are now over eighty-two programs at various stages of development which involve these manpower categories; most are in early developmental stages, although a fair number are fully operational. Seventy percent of these programs are designed to train primary care personnel. Five national professional organizations have established guidelines for the training of physician's assistants or nurse associates. Efforts are under way on a national scale to standardize programs by accreditation and to certify graduates. The Federal expenditure for physician's assistant and nurse associate programs is a large one in relation to all categories of allied health personnel, and it is increasing. Medical-legal questions are under study and are being resolved. There is much positive data about the acceptance of physician's assistants and nurse associates by physicians and patients and about the effect assistants and associates have on productivity of health systems and quality of health services.

II. INTRODUCTION: CRISIS IN HEALTH CARE - PRIMARY CARE - PHYSICIAN'S ASSISTANTS

The health care crisis in the United States is an accepted fact. A great part of the problem stems from a gradually increasing population with a rapidly increasing demand for health services, coupled with a disproportionate increase in, and maldistribution of, the services of physicians, dentists, nurses, and allied health personnel. This situation accentuates the crisis in the areas of greatest need: the inner city with its poverty and dense population and rural America where distance may compound poverty. The nature of health care delivery, in its extreme dependence upon technical procedures and personal services rendered by individuals, transforms much of the health care crisis into a manpower crisis, a trivalent problem involving numbers, utilization [1] and distribution[2] of personnel.

One of the most kinetic trends in the health field has been the growth and diversification of health manpower. In terms of numbers of individuals in health occupations, the health labor force has grown from 1.2 percent of the total labor force, in 1900, to a projected 4.3 percent in 1975. [3] During the decade ending in 1960, the number of health workers increased at a rate twice that of the population increase; [4] during the decade ending in 1970 the rate of increase in health workers was even greater. [5] In terms of diversification of careers, over 260 health careers currently exist, most of which developed after 1945. [6,7]. Many of these careers are outgrowths of the great advances in biomedical science and technology, for example nuclear medicine technologist, inhalation therapist, radiologic health technologist, cytotechnologist and medical engineering technician.

Another dynamic trend in health care, a trend well outlined by Darley[8] and Kissick[9], is the movement in health policy toward comprehensive health care systems. Kissick traces this movement through Federal health legislation which culminates, so far, in the Comprehensive Health Planning and Public Health Service Amendments of 1966. That law calls for: " . . . the highest level of health attainable for every person." [10] Comprehensive health care systems will place health education, prevention and early disease detection on equal par with diagnosis, treatment and rehabilitation. In order to give access to the system, they will place great emphasis on primary care. That emphasis will compel the system to designate agents to deliver primary care, be those agents physicians, nurses with special training, or others depending upon the geography, population, and health resources of a given area.

The traditional concept of the primary care agent is the primary physician, who, as the Millis report [11] depicts him, cares for the whole man. He is the agent of first contact who provides entry into the health system and serves as the primary medical resource and counselor to an individual or family in

all their health needs. It is his responsibility to refer his patient when necessary and to follow up on the recommended care. It is he, also, who should be intimately concerned with health education and the prevention and early detection of disease. Since there are so few family practitioners, pediatricians and those in general internal medicine must also serve as primary physicians for their respective patient populations.

Regardless of its growth and diversification, the health labor force is unable to meet the need and demand for services. The physicians who traditionally render those services are in short supply, both in terms of numbers and distribution. The National Advisory Commission on Health Manpower, in its report to the President in 1967, cites these among other indications of this short supply: long delays in obtaining appointments for routine care; difficulty in reaching a physician at night or on weekends, except through crowded hospital emergency rooms, and hours spent in waiting rooms followed by hurried, and many times, impersonal attention. [12]

Using data from the National Center for Health Statistics[13] Fenderson calculated that the deficit in physician contacts is more than 79 million visits. Of this deficit, 78 percent is in visits for children under age 15. This deficit of visits would require 17,000 full-time physicians to care for the children and an additional 5,500 to care for the adults.[14] In 1963 Stewart and Pennell projected that in order to maintain the then-current doctor-patient ratio for children, roughly one half of the graduates of all medical schools would have to enter pediatrics or general practice during the 60's and early 70's.[15] Clearly this has not happened and the trends do not suggest that it will. Even though the overall doctor-patient ratio improved from 149 per 100,000 population in 1950 to 156 per 100,000 in 1966,[16] the doctor-patient ratio of those physicians providing family care, that is general practitioners, pediatricians, and internists, fell by one third, to 50 per 100,000 by 1965.[17] In 1968 schools of medicine and osteopathy graduated less than 8500 physicians.[18] In order to improve this output, society will have to expend tremendous sums, given the "start up" cost of new medical schools, the cost of expanding medical schools, and the cost of educating a physician. All of this must be met with the recognition that a number of medical schools are in dire financial distress and that the lag time between entering medical school and practice is five to ten years.

Even if there were enough primary physicians, the problem of inadequate delivery of services would remain. This is because the problem of maldistribution of physician services is of equal or greater magnitude than the problem of numbers.[19]

The maldistribution situation is most evident in rural and inner city areas.[20-23] Our nation's capital is an example of urban maldistribution of physician services. Most of the physicians in Washington, D.C. are in the northwest quadrant of the city. In the 19 census tracts in northwest central Washington there are approximately 1050 physicians, but the vast majority of these are in two of the census tracts.[24] The maldistribution of physicians is accentuated by the fact that consumer utilization of health services is a very local phenomenon for most socio-economic strata. In general, for transportational or other socio-ecological reasons, patients travel only a finite distance for health care. Beyond that distance the physician contacts drop off sharply,[25] perpetuating the health problems of our nation.

The crisis in health care is one of a lack of consumer services. It is, in part, a manpower crisis secondary to a dearth of physician-primary care agents and a maldistribution of existing physicians. Given this situation, it is, among other responsibilities, the responsibility of health planners to develop systems to deliver primary care. Such a multifaceted undertaking will involve, among other approaches, organizing health service systems to care for geographically defined service populations, such as community comprehensive health centers or the reorganization of hospital out-patient departments to meet consumer needs; increasing the number of primary care physicians, be they family practitioners, pediatricians, or internists; encouraging primary care physicians to locate in areas of greatest need; expanding the roles of existing health personnel to include more primary care tasks; and developing and utilizing new categories of personnel to assist in the delivery of primary care.[26]

It is the purpose of this paper to review the development of several new manpower categories, the expanded role of nurses as pediatric nurse associates and family nurse practitioners, and the development of a new category, the physician's assistant, and to describe and discuss some of the issues involved.

III. BACKGROUND AND INTEREST

The concept of a physician's assistant, an assistant who works at the physician-patient interface, to whom the physician delegates tasks, and who, after proper training, may undertake degrees of independent function, is by no means new. The Russian feldsher, described by Sidel is, perhaps, the oldest example; they were active in the 1700's. Feldshers are a type of "middle medical worker" and function at a level between physicians and auxiliaries. Currently, feldshers, in urban areas, function in a role dependent upon the physician, but in rural areas often serve as primary care agents in feldsher-midwife stations.[27,28] The "assistant medical officer" is another example from outside the United States.[29]

In the U.S., public health nurses in many localities have long performed many primary care duties. The Frontier Nursing Service of Leslie County, Kentucky, has, since 1925, provided most of the health care, particularly maternal and child care, to residents of that county.[30]

The Armed Forces of the United States have long trained corpsmen to assist in the delivery of health services to both members of the military and to their dependents. During each of the last four years about 32,000 men have gone through the combined basic schools for corpsmen of the Army, Navy, and Air Force. A smaller but still significant number go on for further training which has direct applicability to delivery of primary care. Of those some become quite highly trained. For example, the Army Special Forces and Navy "B" Corpsmen receive 1,400 to 1,600 hours of formal medical training.[31] The fact that in every recent year over 30,000 Corpsmen leave the service,[32] 3,000[33] to 6,000 of whom have had significant independent duty or primary care experience, has prompted a great interest in the possibility of channeling these men into civilian health careers.[34-38] In response to this interest the National Academy of Sciences has produced an informative study on the subject,* and the Department of Health, Education, and Welfare has developed Operation MEDIHC (to be discussed later) to coordinate activities with the Department of Defense's Project Transition[40] in order to place corpsmen in civilian health jobs or training programs leading to such jobs. Even though it is clear that discharged corpsmen will not meet the total manpower needs for physician's assistants and other allied health careers, nevertheless, that valuable manpower resource must be and is being tapped.

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* Please see Note 32.

Private physicians in this country have had much experience with the training, utilization, and delegation of tasks to assistants. Yankauer's national survey of pediatric practice,[41-43] Coyne and Hansen's survey of practicing physicians in Wisconsin,[44] Beasley's survey of physicians in 32 Appalachian counties[45] have all shown that a significant percentage of American physicians now use, would use, or at least see the need for specially trained assistants to the physician. Among others, Hudson,[46] Connelly,[47] Lewis,[48] and Rogers,[49] with reference to general medical practice and to ambulatory care settings, have suggested the potential of or described the benefits of using non-physician personnel, particularly nurses with broad responsibilities, to increase quality and productivity of health care delivery. Thus, the concept of the physician's assistant and task delegation is nothing new to physicians in the U.S. It is only the formalization of training and utilization of physician's assistants that is new.

This formalization has been and is emerging primarily in university medical centers. Though the vast majority of programs to train physician's assistants and nurse associates are in university centers, more recently programs are being developed by state and local health departments and by colleges. Both professional journals and the lay press have given much attention to the pioneers in the field. Duke University, with its physician's assistant program,[50-52] University of Colorado with its pediatric nurse practitioner and child health associate programs,[53-56] and the University of Washington with its MEDEX (*MEDicin EXtension*-Physician Extension) program, a program totally directed toward increasing primary care in areas of greatest need,[57,58] are centers of activity and interest. In Philippi, West Virginia, Alderson-Broaddus College, affiliated with Broaddus Hospital and Myers Clinic, is a prototype of the college-based physician's assistant program.[59] Health Departments in California, Ohio, Pennsylvania, North Carolina and New York City have programs or are developing programs to train pediatric nurse associates. Kaiser Permanente is developing similar programs.[60] The University of New Mexico's "Estancia" project is using a public health nurse with special training to deliver primary care to an isolated population 60 miles from the nearest medical services. The town could not attract a physician.[61] This activity has prompted several articles which list some of the programs and discuss some of the issues involved.[62-65] There are now over 82 programs at various stages of development which are training primary

care or specialty care physician's assistants, pediatric nurse associates or family nurse practitioners.* Of these programs, approximately 70 percent are designed to train primary care personnel. Primary care personnel include practitioners of both pediatric and adult medicine. We use the American Academy of Pediatrics guidelines for pediatric nurse associates to define primary pediatric care nurse personnel, and the National Academy of Sciences--AAMC guidelines to define primary care and specialty care physician's assistants.

A task group of the American Academy of Pediatrics (AAP) has compiled a list of over 60 potential training programs for pediatric nurse associates. (Please see Note 60.) The BHME and AAP lists have the least overlap and are the most inclusive. Of the programs listed, we identify 57 primary care directed programs and 25 specialty programs, a total of 82 separate programs. In doing so, we include only 33 programs of "highest priority" from the AAP list. "Highest priority" is the AAP's designation. In that list there are also over 25 potential programs, though they are not as well developed as the 33 of highest priority. Some programs, Duke's and Bowman Gray's, for example, produce both specialty and primary care personnel. Most of the programs listed are not yet fully operational. Many are only in the planning stages, some are in the pilot testing stage, and some have been in operation for a few years.

A. Interest of National Organizations

One of the most important developments involving physician's assistants and nurse associates has been the interest that national professional organizations have taken. The American Medical Association (AMA), through its Council on Health Manpower, the Board on Medicine of the National Academy of Sciences (NAS), the Association of American Medical Colleges (AAMC), the American Academy of Pediatrics (AAP) and the American Society of Internal Medicine (ASIM) have issued position statements containing guidelines for definitions and education of physician's assistants and the expanded role of nurses in patient care. In addition, the National Center for Health Services Research and Development of the Health Services and Mental Health Administration, in the interest of establishing equity of access to high-quality primary care, has undertaken a large

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* The Division of Manpower Intelligence of the Bureau of Health Manpower Education (BHME) at the National Institutes of Health has compiled a list of over 100 programs.[66] The Manpower Management Branch of the Office of Personnel of the Health Services and Mental Health Administration has a draft list of over 40 programs.[67] The Association of American Medical Colleges (AAMC) has generated a list of 18 programs.

scale, five year research and demonstration effort to produce measurements, observations, and professional experience, which will be available to policy makers and health planners, in both the public and private sectors, to enable them to determine the impact of assistants to the physician on health care delivery.[69]

The AMA's "Guidelines for Development of New Health Occupations"[70] warns against rigidity of job description and calls for an in-depth analysis of issues involved. The AMA's Committee on Emerging Health Manpower is developing a comparative analysis of physician support personnel and programs. Early in 1970, the AMA, recognizing the critically short supply of health services, took a significant position in favor of the expanded roles and responsibilities of nurses in patient care.[71] These roles are being formalized for pediatric practice by the guidelines for the functions and training of pediatric nurse associates proposed by the AAP.[72,73] The AAP has discussed the guidelines with representatives of the American Nurses Association (ANA) and the National League for Nursing (NLN).[74] The statements by the Ad Hoc Committee on Allied Health Professionals of the ASIM, the AAMC Task Force on Physician Assistant Programs and the Board on Medicine of the NAS are all specifically about physician's assistants.

B. Interest and Activity of Federal Agencies

One of the recommendations of the National Advisory Commission on Health Manpower in its 1967 report was that the Federal government should give high priority to the support of experimental programs, under university direction, which train and utilize new categories of health professionals. This significant recommendation calls for an extension and expansion of the traditional Federal role of support for the training of existing health manpower categories.

The agency most involved in the development, demonstration, testing, and evaluation of health manpower innovations is the National Center for Health Services Research and Development of the Health Services and Mental Health Administration of the Department of Health, Education, and Welfare. The National Center is doing this in the context of developing a national protocol for the evaluation of manpower innovations. The national protocol, once developed, will provide a means of early assessment and systematic analysis of "new manpower" programs. In this project the National Center will rely heavily upon the advice of scientific and professional advisory committees, drawn from universities, private professional organizations, and from industry.

In order to develop the national evaluation protocol the National Center is funding a number of projects in univer-

sity centers which are serving as models. The National Center is continuing the University of Washington's MEDEX type of physician's assistant program and is replicating that program in an inner city area, at the Charles R. Drew Postgraduate Medical School in Watts, California; in the rural central plains, at the University of North Dakota; and in the rural northeast, at Dartmouth Medical School. It plans a fifth site by January 31, 1971. The MEDEX projects received over 2.9 million dollars in funding in fiscal year (FY) 1970, of a total project cost of over 6.7 million. This will be one of the largest single expenditures for the development and analysis of any allied health manpower category. For further information for the evaluation protocol and because of the great need for health services of the citizens under age 15, especially in low and middle income families, the National Center plans to fund ten large-scale demonstration pediatric nurse associate projects by 1975. Two pediatric nurse associate projects, one at the University of Colorado and one at the Kaiser Foundation Research Institute, and the family nurse practitioner project at the University of New Mexico received over $641,000 in FY 1970. Other "physician extender" programs which the National Center plans to support in the interest of research and development are: 12 university or college based (non-military) physician's assistants programs; school nurse practitioner programs to teach school nurses expanded functions to increase health services to school children and, at a later stage, to their families; nurse midwife programs to help overcome the projected shortage of obstetricians and general practitioners; and clinical pharmacy programs which will train pharmacists to take a greater role in health services delivery.

Several divisions of the Bureau of Health Manpower Education (BHME) of the National Institutes of Health are supporting physician's assistants programs and programs for the expanded role of nurses. The Division of Nursing is funding a number of programs for nurses including pediatric and family nurse practitioner programs and a nurse midwife program. The Division of Allied Health Manpower is supporting several programs which are training "specialist" physician's assistants such as orthopedic, urologic, and anesthesiology assistants. The Division of Physician and Health Professions Education and the Division of Manpower Intelligence have supported a number of activities in this area.

There is also activity outside DHEW. The Education Service of the Veterans Administration (VA's) Department of Medicine and Surgery is planning a pilot study involving VA-supported programs to train physician's assistants. The VA would coordinate its programs with, among others, medical schools and schools of allied health professionals. Much of the clinical training in these programs would take place

in VA hospitals. The VA is particularly interested in physician's assistants with specialty training, such as surgical assistants, but would also require a broad medical background gained through as many as five clinical rotations. Those doing the pilot study are acutely aware of the need for equivalency testing or other methods of standardization which would allow the physician's assistants to qualify for and to get jobs outside the VA.

Operation MEDIHC (Military Experience Directed Into Health Careers) is a joint DHEW - Department of Defense (DOD) program to help discharged service men and women with health service experience to enter health careers or to get training leading to such careers. Operation MEDIHC was begun in December, 1969 to supplant Operation REMED.[97] MEDIHC is coordinated with the Transition program of DOD which is operational at more than 200 installations throughout the U.S. Operation MEDIHC is an identification, counseling, and placement service which functions primarily through offices at the state level.[98] As of late summer 1970, there were over 40 operational MEDIHC agencies in state health departments, state hospital associations, or Comprehensive Health Planning Agencies.

Many significant activities involving Federal agencies are developing. Many of those are undertakings in which the participating agencies actively are seeking or will seek the advice and counsel of professional organizations in the private sector on manpower questions. The Division of Manpower Intelligence of BHME recently invited representatives of 13 medical organizations including the American Nurses Association to discuss physician manpower problems. A second meeting was held in January, 1971, to discuss methods of assessing and meeting medical manpower needs. The Division of Nursing of BHME and the Health Services Manpower Branch of the NCHSR&D advocate a national pediatric nurse associate curricular conference, at which representatives of the various organizations involved could work toward standardization of aspects of curriculum, equivalency and cost. It is just such joint government and private interdisciplinary efforts which are necessary to cope with the problems of health services delivery.

IV. PHYSICIAN'S ASSISTANTS

A. Guidelines: ASIM

The report of the Ad Hoc Committee on Allied Health Professionals of the ASIM[75] established definitions, functions and training guidelines for three categories of physician support personnel: physician's assistants, specialist assistants and medical (office) assistants. The "physician assistant," in the ASIM definition, is a medical health worker trained in aspects of general patient care through a formal two-year course. The area of the spectrum of patient care where his skill as an assistant lies is that in which services are provided by the internist or general practitioner at a physician level. These are the physicians to whom the "physician assistant" relates. The "specialist assistant" is also a physician's assistant, but has received formal training in aspects of patient care characterized by a particular age group--pediatric assistants; end organ--ophthalmologist assistants; and organ system and form of therapy--orthopedic assistant. The "medical assistant" receives two years training in both administrative and office duties and elements of patient care. The ASIM Committee felt that the physician's assistant should be a career occupation, ". . .not a stop-gap employment. . .between high school and marriage."[76] Nevertheless, the Committee felt that the education should be structured to offer great possibility for vertical and horizontal mobility. While the majority of the Committee recommended that the physician assistant should be educated in a two-year community college program leading to an associate degree, they did not believe the specific details of training should be part of ASIM policy. The Committee proposed that a board, with members named by the Council on Medical Education of the AMA, the ASIM and other specialty organizations, the American College of Physicians (ACP), the American Academy of General Practice (AAGP), and the newly incorporated American Association of Physician Assistants (AAPA), should certify graduates and evaluate training programs and continuing education programs.

The ASIM has held two workshops on physician's assistants which brought together representatives of the AAGP, ACP, AMA, AAMC, AAP, the American Association of Junior Colleges and the Association of Schools of Allied Health Professionals.[77] The ASIM has also conducted a survey among internists of present use of allied health personnel and attitudes toward task delegation.[78]

B. Guidelines: AAMC-NAS

Two major statements on physician's assistants, striking in their comprehensiveness, detail, and similarity, are the

Task Force Report of the Association of American Medical Colleges and the report approved by the Board on Medicine of the National Academy of Sciences. The reports focus on assistants who work at the physician-patient interface, who differ from other health-related personnel in that they are selected by and trained by physicians and, administratively, report directly to physicians. The assistants have the ability to extend the arms, legs, and brains of the physician. Recognizing the shortage of all existing health personnel, the reports envision a new primary pathway into the health field through a new category of physician's assistants which would expand the range of health careers and would enhance the recruitment of male as well as female candidates.[79,80]

The reports define three types of physician's assistants, primarily in terms of the nature of services each is equipped to render by virtue of breadth and depth of the medical knowledge and experiences, and by their ability to make degrees of independent judgments:

> *The Type A assistant is capable of approaching the patient, collecting historical and physical data, organizing the data, and presenting them in such a way that the physician can visualize the medical problem and determine appropriate diagnostic or therapeutic steps. He is also capable of assisting the physician by performing diagnostic and therapeutic procedures and coordinating the roles of other, more technical assistants. While he functions under the general supervision and responsibility of the physician, he might under special circumstances and under defined rules, perform without the immediate surveillance of the physician. He is, thus, distinguished by his ability to integrate and interpret findings on the basis of general medical knowledge and to exercise a degree of independent judgment.*
>
> *The Type B assistant, while not equipped with general knowledge and skills relative to the whole range of medical care, possesses exceptional skill in one clinical specialty or, more commonly, in certain procedures within such a specialty. In his area of specialty, he has a degree of skill beyond that normally possessed by physicians who are not engaged in the specialty. Because his knowledge and skill are limited to a particular specialty he is less qualified for independent action. An example of this type of assistant might be one who is*

highly skilled in the physician's function associated with a renal dialysis unit and who is capable of performing these functions as required.

The Type C assistant is capable of performing a variety of tasks over the whole range of medical care under the supervision of a physician, although he does not possess the level of medical knowledge necessary to integrate and interpret findings. He is similar to a Type A assistant in the number of areas in which he can perform but he cannot exercise the degree of independent synthesis and judgment of which Type A is capable. This type of assistant would be to medicine what the practical nurse is to nursing.[82,83]

Both reports, as did the ASIM guidelines, stated that the physician's assistant should not establish an independent practice and that he shall work in a dependent relationship with the physician.

In recommending guidelines for education programs, particularly for Types A and B, the reports emphasized that the curriculum should lead to a broad general understanding of medical practice and therapeutic techniques, even for those students who may concentrate their efforts and interest in a particular specialty of medicine. The Type A will usually have four stages of training: (1) basic general education; (2) basic scientific education; (3) general clinical training; (4) specialized clinical training in some aspect or aspects of medical practice.[83] The Board on Medicine's report indicated that the first two types of training may be available at a variety of institutions, including junior colleges and colleges. It also stated that, because of the amount of physician time required, it would be economically unfeasible to provide the last two types of training outside teaching hospitals and institutions participating in the training of physicians. The AAMC Task Force stated that an approved program must be sponsored by a college or university with arrangements for clinical teaching. With some allowances for an individual's previous education and experience, both reports anticipated that the amount of clinical and didactic knowledge a Type A assistant would require could rarely be acquired in a program of less than two years. The length of the Type B program might be more valuable.

The minimal prerequisites for admission, about which both reports were in agreement, were ability to use written and spoken language in effective communication with patients, physicians, and others; certain behavioral characteristics of honesty and dependability; and high ethical and moral standards

in order to safeguard the interests of patients and others. Both indicated that a high school diploma should be adequate preliminary education. The reports included the following examples as guides to admission:

(1) For Degree-Granting Programs: A candidate might be selected for the professional portion of the training following successful completion of the first two years of course work in an affiliated college or university as a part of its baccalaureate degree.

(2) For Non-Degree (Certificate) Programs: A candidate might be selected if he has a high school diploma or its equivalent, plus previous experience in health-related work, preferably including education and experiences in direct patient care, plus statements of recommendation from physicians or others competent to evaluate behavior and moral characteristics.

Both the AAMC Task Force report and the NAS report stated that accreditation mechanisms should be established. And both, throughout, in tone and statement, indicated that programs, definitions and accreditation standards should be flexible enough to allow for innovational improvements.

In approving its report, the Board on Medicine: (1) endorsed the concept of expansion of physician services by the use of physician's assistants; (2) endorsed and supported continued exploration of the effect of such assistants in a variety of clinical settings; (3) urged the cooperation of the AAMC, AMA, and government in the establishment and review of educational standards for training programs, the resolution of legal barriers, and the establishment of uniform systems for testing and certification of such assistants.[84]

C. Physician's Assistants: Programs

Of the over 35 programs which train physician's assistants, there is enough information about 25 programs to draw some general conclusions about them. Of the 25, seven have been training physician's assistants for two or more years, five for one year, and nine others are "operational." From the information available the programs appear to meet or to surpass the NAS-AAMC guidelines in location and requirements for entrance. All but three are college or university centered, and those three are located in hospitals. All but one are integrated with a medical care facility and most are in university medical centers. All of the programs require a high school diploma or its equivalent and practically all of the one and two year programs require or recommend previous experience in health care.

Here experience as a military corpsman is most mentioned. Five programs require two years of college or college courses. There is information to indicate that students in many of the programs may be extremely well qualified. For example, of the 40 students in Duke University's 1970 entering class, 16 have two or more years of college, 30 are former corpsmen, and the average medical care experience per student is five years.

The area where the programs differ significantly from the guidelines was in length of training. Ten of the 25 programs were less than two years, but one year or more, in length. The entrance requirements for those ten, however, were more stringent than for the other programs. The four which were "specialty" programs, for which the NAS-AAMC guidelines allowed greater variability in length, require college courses or hospital experience. Of the six "primary care" programs four were MEDEX programs of 15 month duration and which require independent duty experience and, therefore, some of the most highly-trained corpsmen.

The content of physician's assistants programs is more difficult to judge from the descriptions of the programs, but their curricula did appear to conform generally with the four stages of training recommended by the NAS-AAMC reports. Journal articles which describe the individual programs give the best estimate, after site visits, of the curriculum content of those programs. The clinical training of many programs is very similar to that of medical students, either in hospitals or in preceptorships.[85-87]

The duties which physician's assistants are taught include: performing physical examinations, taking histories, diagnostic procedures, emergency care and minor surgical procedures, routine laboratory work, triage, home and nursing home care, making hospital rounds to gather data for the physican, and numerous administrative duties.

Of the 25 programs, nine are "specialty" programs training orthopedic, pathology, surgery and mental health assistants, among others, and 16 are "primary care" programs in general medicine or pediatrics. Some of the programs, Duke's and Bowman Gray's, for example, train both types. These 25 programs have, as of fall 1970, produced slightly over 200 graduates. Their potential, however, is significant. Duke, a two-year program, for example, has admitted 40 students in each of its last two entering classes and anticipates a class of 100 in 1971.

A registry for physician's assistants is being incorporated and may lead to a greater standardization of programs. In time

it may be through such organizations that more information on most of the physician's assistants programs will be available.

V. PEDIATRIC NURSE ASSOCIATES

A. Pediatric Nurse Associates: Guidelines

The American Academy of Pediatrics has been, perhaps, the most active of any national organization in formalizing the expanded role of nurses in primary care. In doing so, it is consulting the American Nurses Association and the National League for Nursing as well as the American Medical Association, the Association of American Medical Colleges, the American Association of Junior Colleges and other organizations. The Executive Board of the AAP has approved the establishment of a Division of Allied Child Health Manpower to implement the Academy's guidelines. The AAP has taken this position with the recognition that in order to meet the need and demand for health services, organized medicine must experiment with new and improved ways to deliver care. Part of this reorganization will involve more efficient use of existing manpower resources through the delegation of tasks to properly trained pediatric nurse associates, pediatric office assistants and pediatric aides.[88] In order to facilitate its approach, the official position of the AAP is"...that a physician may delegate the responsibility of providing appropriate portions of health examinations and health care for infants and children to a properly trained individual working under his supervision."[89] The Academy further recommends that "...such personnel...must work under the supervision of a physician..., that such personnel must be tested to determine competency...and that they...should be given appropriate certification."[90]

The AAP defines three categories of assistants:

1. Pediatric Nurse Associates are colleagues or companion practitioners with training sufficient to have the ability to share in the personal care of patients. A pediatric nurse associate:

   a. will be a registered nurse who has completed a diploma program or an associate degree nursing program, or who is a graduate of a baccalaureate nursing program.

   b. will have completed a recognized pediatric nurse associate program.

   c. will work primarily in a physician's office, clinic, or health center involved in the delivery of ambulatory health care to children.

d. will work under the supervision of a physician in accordance with standing orders which define her physician-dependent responsibilities.

e. responsibilities may include activities which are directly related to patient care, i.e., obtaining medical and health histories, performing portions of the physical examination, giving information and counsel, and managing health problems as determined by the physician.

2. Pediatric Office Assistants are persons with formal training who, under supervision, carry out the delegated tasks or skills in which they are trained and certified. This will include some personal care. The licensed practical nurse with special pediatric training will be included in this category.*

3. Pediatric Aides are defined as persons having little or no formal training who, under supervision, carry out defined routine tasks of a non-skilled nature.*[91]

Certain of the AAP guidelines for the training of pediatric nurse associates are as follows: Educational programs may be established in properly accredited schools of nursing, colleges and hospitals provided that hospitals or pediatricians' offices suitable for directed experience are available. Pediatric groups may establish programs in cooperation with community colleges and hospitals. Such groups and hospitals must be approved by the AAP. The programs must be of no less than the equivalent of four months study. The financing of the education of the programs should not necessarily depend upon student tuition fees. The medical and nursing directors of the programs should be acceptable to the AAP Division of Allied Child Health Manpower.[92]

During the training program the pediatric nurse associate should be equipped to: take medical and developmental histories; perform physical examinations; carry out developmental screening on children from newborn through preschool age; give definitive advice and counsel to parents on problems of child-rearing, feeding, growth and development; make home visits when deemed necessary in light of nursing problems; answer certain predetermined telephone inquiries from parents; identify non-patient care tasks of a technical and clinical nature and find ways and means of allocating those to trained aides and secretaries; identify resources available in the community to help children and their families, and guide parents in their use; and plan and work as a member of a team directly responsible for child health service in unfragmented systems of comprehensive and curative health care.[93]

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* We have not included the AAP's guidelines for these categories.

B. Pediatric Nurse Associates and Family Nurse Practitioners: Programs

In listing 33 programs of "highest priority" which are training or could train pediatric nurse associates, the American Academy of Pediatrics felt that these programs already conformed with or could easily comply with the AAP guidelines. The Bureau of Health Manpower Education (BHME) compilation contains information about 12 pediatric nurse associate programs, eight of which are AAP programs of "highest priority." These 12 programs appear to conform well with the AAP guidelines. As to location, eight are in university medical centers and four are in teaching hospitals. Essentially all require students to be registered nurses. All but two of the programs are four months or longer in duration. Those two are three months. From available information the curricula generally appear to meet the AAP guidelines,[94,95] nevertheless, as with the physician's assistants programs, closer scrutiny by an accrediting body would be required to make a real judgment.

The family nurse practitioners programs are yet few in number but have a great potential to augment family primary care services where such services exist and to provide primary care services where no physicians are available. In Estancia, New Mexico, an R.N. with 10 years experience, and after a six-month course with continuing education at the University of New Mexico School of Medicine, is providing primary care services to a population of 6,000 sixty miles from the nearest physician. Though the evaluation is still underway, the nurse practitioner has demonstrated that she can personally handle approximately 70 percent of the patients' problems.[96]

There are three other programs which train nurses to provide a variety of family primary care services. One, at the Montefiore Hospital--Martin Luther King, Jr., Health Center in the Bronx, has trained approximately 30 nurse practitioners. The University of California School of Medicine, Davis, in conjunction with the State Department of Public Health, is enrolling its first class in a masters program in public health which will train primary care agents to perform many heretofore physician functions. The Albert Einstein College of Medicine--Jacobi Hospital program has trained "nurse physician surrogates" who provide total home care for patients with chronic diseases, most of whom would otherwise have to be in the hospital or in extended care facilities. The nurses so trained make numerous house calls and do, among other tasks, physical examinations, take electrocardiograms, renew prescriptions and change medications within limits and under a physician's supervision.

Of the 16 pediatric nurse associate and family nurse practitioner programs mentioned above, all are operational but one, which is waiting for funding, nine have been operational for one year or more and three for more than four years. During that time they produced just over two hundred graduates. Now, six of the programs have a class size of ten or more and most of the 16 have the potential, with funding, for significantly larger classes.

VI. ISSUES

A. Career Mobility

Vertical, horizontal, and geographic career mobility is a many-sided issue which is intertwined with certain basic traditions in American national and professional thought, and in private and governmental policy. It is an issue which involves questions of the responsibilities not only to maintain individual freedom but also to insure public protection. Certain of these questions, particularly geographic mobility, governmental licensure and private certification, will be discussed under legal recognition.

Career mobility is also an issue which is integrally related to health manpower planning, for it is one route through which health service delivery systems can meet the problems of numbers, utilization,[99] and distribution of personnel with the least wastage of training and manpower resources. Geographic mobility can contribute to overcoming the distribution problem, as can vertical and horizontal mobility overcome the problem of numbers of trained personnel and foster maximal utilization of skill and knowledge at a minimal cost to the system. Those in health planning should seek to overcome the academic and legal barriers to career mobility, but they must do so, always, with the balance of individual freedom and public protection foremost in mind.

In their guidelines for physician's assistants programs, the task group of the American Society of Internal Medicine[100] and the Board on Medicine of the National Academy of Sciences faced the problem squarely and called for a flexibility of accreditation and certification processes and of the academic curricula which would contribute to career mobility. The Board on Medicine, recognizing that a non-degree (certificate) graduate may wish to earn a Baccalaureate degree, the vertical route to the M. D. degree, urged that colleges and universities consider a reversal of the usual sequence, permitting the professional courses in the physician's assistant program to apply toward a degree, if the required pre-professional courses were completed later.[101] The Board felt that assistants, who might desire to become independent practitioners, could do so by obtaining an M.D. degree. The Board also felt that, if an assistant could demonstrate, on the basis of performance and equivalency examinations, that he had mastered many of the functions and concepts normally taught third and fourth year medical students, he should then be able to go through medical school in less than four academic years.[102]

The "reversed" curriculum concept calls for a coordination of training programs with existing academic structures. The

coordinated approach is very much in the minds of those in the NCHSR&D and the VA and many in universities who are involved with physician's assistants programs. It may be a goal that most innovative manpower programs should seek. Further, it may be an approach which should be of mutual concern to military and university health planners and educators, as a means to facilitate the change from corpsman to civilian health worker with the least waste of personal and public resources and with a net gain in health services.

The concept of equivalency and proficiency testing as a mechanism to attain career mobility is a popular one and is being utilized, but its use is as yet embryonic given its potential. The Congressional hearings on the 1970 Allied Health Professions bill disclosed that there is interest in equivalency testing in DHEW and that the Division of Allied Health Manpower of BHME is under contract to develop equivalency tests in four subject matter areas of the medical laboratory field.[103] This is a contribution which should receive continued support, effort, evaluation and expansion.

B. Legal Recognition: Current Legal Status

The uncertainties of the legal status of physician's assistants center upon the issue of delegation of tasks. Indeed, in the opinion of Forgotson, Roemer and Newman, in their legal study accepted by the National Advisory Commission on Health Manpower, the problem of delegation of function is: "Among the many problems presented by the medical licensure laws, without question,. . .highly significant, if not the most significant problem requiring resolution.[104] Leff states that "The greatest danger in the use of paramedicals lies in their unlicensed status,"[105] or, at least, when unrecognized in some other way by law, not necessarily by licensure. In the case of physician's assistants, the problem of delegation of tasks must be resolved before maximum utilization of this new manpower category can be achieved. Forgotson and Roemer state with respect to delegation in general, that without that resolution, "No over-all effective strategy for the production and use of manpower can be implemented. . ."[106] Thus, in many ways, the complexities of the physician's assistant's legal status reflect, in microcosm, the legal complexities which might affect any new manpower category. An acquaintance with these problems is necessary for a full appreciation of the present status of physican's asssistants and nurse associates.

The legal status within the present statutory framework is not so much a problem for nurse associates who are licensed as registered nurses. For professional nurses, the expansion of functions into the areas for which nurse associates are trained

may be treated merely as a part of the ongoing redefinition of the scope of nursing practice which has continued since the profession was established. With official recognition through licensure as a nurse of a basic level of competence in health care, a registered nurse might have relatively little difficulty in asserting that such recognition, when coupled with additional training and with supervision of an employing physician or health care institution, authorizes her to perform the duties of a nurse associate.[107] This is the assessment made by those at the Universities of Colorado, New Mexico, and Virginia who feel that no change is necessary in the legal status of a registered nurse who is trained to be a pediatric nurse associate or family nurse practitioner.[108-110] Legal counsel of the AMA likewise feel that the present legal context of professional nursing is sufficiently flexible to allow for continued transfer of functions from medical to nursing practice without undue exposure of personnel to legal liability, provided that additional training, physician approval, and patient need all precede such transfer.[111,112] The question of the legal status of physician's assistants, a completely new and unrecognized category with no legal tradition, is more difficult.

The legally unrecognized status of physician's assistants is, for many reasons, of major importance for those health care delivery systems which would utilize them. Much of the problem results from the status quo of health manpower licensure mechanisms.

The licensure of health manpower is a function of State rather than Federal government under the authority of the State to legislate for the public health, welfare, and safety of its citizens.[113] At present, there are approximately 25 health professions and occupations licensed by one or more of the States.[114] Laws licensing health manpower have typically progressed from the permissive, by merely preventing the use of a given title by the unlicensed, to the mandatory, by making criminal any action within the scope of a licensed profession by one not licensed by that profession.[115] It is this mandatory aspect of State health personnel licensing statutes, of which violations are criminal, that prevents the <u>independent</u> function of new manpower categories without an explicit authorization. Midwifery is a good example of a legally authorized independently functioning allied health occupation. Most states allow for the licensed practice of midwifery, and some, California[116] and New Jersey[117] for example, have rather detailed statutes. In the case of physician's assistants, however, the functions of this new category are <u>dependent</u>, to be performed only under the supervision of a physician.[118]

The delegation of tasks to a dependently functioning, unlicensed physician's assistant in most states must conform,

broadly speaking, with two types of legal standards, criminal and civil. Such delegations, depending upon the state and the court, may expose both assistant and physician to violations which are criminal. The assistant may be charged for practicing without a license and the physician for aiding and abetting such unlawful practice.[119] Just this situation occurred in People vs. Whittaker[120] in California. This, however, is the only case on record involving what we define as a physician's assistant, and, at the time of that case, the defendant had not completed a formal training program.

The other, and more significant, legal standard to which task delegations must conform is the standard of care required of health personnel in tort and malpractice litigation. In civil actions for personal injury damages, the physician may be held liable under two different theories for injuries resulting from the actions of his unlicensed assistant. These are the doctrine of respondeat superior, commonly called the master-servant doctrine, and the doctrine of negligence per se. Under the doctrine of respondeat superior, the physician is responsible for negligent actions of any person in his employ. Of course, liability based on this doctrine holds, regardless of licensure or any other formal arrangement, as long as an employment relationship exists.[121] The master-servant doctrine by itself would not seem to unduly inhibit the use of physician's assistants, and it undoubtedly serves a useful function of giving the employer a personal legal stake in the quality of care delivered by his assistant. Certainly such a check is desirable in the relationship where there is an inherent temptation on the part of both parties to expand the scope of the assistant's operation as the physician's confidence in him grows.[122]

Less desirable, however, is the possible effect of application of the doctrine of negligence per se, which holds that liability inheres where an injury results from an act committed in violation of a statute, regardless of whether actual negligence is involved. Through the operation of this doctrine, the act itself of delegating to an unlicensed assistant may be construed as constituting negligence if injury results, without regard to the actual care or skill with which the task was performed.[123] Although few suits have touched upon this issue, and none of those has yet involved a physician's assistant, the oft-cited Barber v. Reinking[124] case in Washington state is an example. In that case, the Washington Supreme Court held that the delegation to a licensed practical nurse of the task of administering a polio shot was negligent per se, because of the existence of a statutory provision that permitted only licensed professional nurses to give innoculations. Deciding the case strictly on the basis of the nurse's lack of license to perform such acts the court refused to accept a custom and usage defense,

that is, it refused to consider the fact that most physicians in the area allowed their licensed practical nurses to give injections. In other states, the lack of a license is admissable as evidence to be weighed against custom and usage.[125] Nevertheless, the case occurred and suggests the potential problems of utilizing a new manpower category in the current licensure situation.

Delegation of health service tasks is predominately governed by prevailing custom and usage of a profession.[127] But for many reasons, custom and usage is a hazardous way to legitimize delegation of functions. As Ballenger points out, if a patient launches a malpractice attack against a physician, alleging that the physician was negligent in delegating or that the particular task delegated was beyond the competence of the particular assistant, the physician must rely solely on a custom and usage defense.[128] And as Barber v. Reinking illustrates, such a defense may be overturned. Beyond this there are other reasons, well outlined by Ballenger, not to rely upon custom and usage to legitimize a new manpower category:

> *Until the use of (physician's assistants) became sufficiently widespread to be regarded as ordinary practice, there is no "custom and usage" and therefore no protection. However, to establish a custom and usage defense, it is not necessary that all or even a majority of the physicians in an area actually employ to use this type of assistant. As long as a respectable group does so, this protection could exist. It should be noted that the physician is often judged against a "locality" standard. At present, the number of physician's assistants is small, and they are widely dispersed around the country. Such concentrations as there are are primarily in large medical center communities, and the ordinary practice in a large training hospital may afford little protection to the rural doctor in a different set of circumstances. Although it is forecast that improvements in travel and communication may end the "locality" approach, this is uncertain as yet and may give rise to non-innovational pockets in precisely the areas most in need of this new type of manpower.[129] Even when the particular assistants are used more generally, whether the "custom and usage" is sufficient to legitimize the practice is a question for the jury to determine in the particular case. . . .*[130]

And as Forgotson points out, "(T)he determination by a jury of legality or illegality on a basis of medical custom and usage

in the jurisdiction may not correspond to wisdom, logic, the realities of patient safety, or good medical care."[131]

C. Legal Recognition: Proposals and Discussion

Several proposals have been offered as methods of resolving the legal uncertainties outlined above. The common denominator of these varied approaches is the effort reflected by the proponents of each to weigh the demands of consumer protection against the ever more urgent need to maximize utilization of manpower resources. The ideal proposal would be one which completely reconciled these frequently conflicting policies without conceding any part of either. In the interest of fostering maximum utilization of manpower and still providing consumer protection, an ideal proposal would provide for a number of desirable ends:

(1) Protection of physicians and assistants from suits that depend, for assessment of damages, upon standards other than the finding of actual negligence.

(2) Maximum feasible vertical and horizontal mobility of health personnel.

(3) Geographic mobility of personnel.

(4) Freedom of innovation in manpower utilization and training with reasonable safeguards.

(5) Smooth integration of new types of personnel into the traditional health team.

(6) Prevention of loss of manpower effectiveness through obsolescence of standards.

(7) Provisions to enhance quality of care.

(8) Provisions for prevention of unsafe delegations.

The complete package should be able to meet the final test of political feasibility.

Alternatives toward gaining legal recognition for physican's assistants include:

(1) Preserving the Status Quo

The first alternative to gain legal recognition for physician's assistants is to maintain the status quo. Such a

policy would count on the eventual legitimization of delegations to assistants through the incorporation of such practices into the custom and usage of the health professions. This would take time and would risk those problems discussed above. Further, Forgotson states, "Legal regulation developed through jury determinations of medical custom and usage may produce inconsistencies and uncertainties in the law, may impede innovations in health service, and finally, may not provide adequate assurance of patient safety."[132]

A step toward patient safety and quality control within the present situation would be a system of voluntary accreditation of training programs and certification of graduates by private professional organizations. The AMA has already approved, "in principle," the accreditation of training programs for physician's assistants.[133] While this type of private regulation usually guarantees higher standards of competence than do licensure laws,[134] there are limits to its effectiveness. Private certification can be highly effective, but only ". . .so long as no significant commercial or financial attractions propel uncertified and unqualified personnel into the field,"[135] with deterioration of quality and concomitant inflation in the cost of health services. Moreover, a private system of accreditation and certification may be limited in that it is voluntary unless, of course, its standards are existant and are incorporated into laws.[136]

(2) Licensure of Physician's Assistants as a New Category

The traditional method of providing legal recognition for a new manpower category is to license it. Licensure would assure conformity to at least minimal standards of competence, and it would protect the assistant and his physician employer from some of the possible disciplinary, quasi-criminal proceedings and, to a degree, from the doctrine of negligence per se. There are, however, many negative aspects to licensure of a new manpower category which arise largely from the very nature of the current licensure system. The greatest of these is the rigidity of licensure.

Ballenger states:

> *Perhaps the principle detrimental effect of the licensure scheme lies in the area of manpower utilization. . . .In view of the rapid strides in medical knowledge and technology which characterize the present age, it is likely not only that an expanded spectrum of activity will be within the capabilities of non-physician personnel equipped with intricate and accurate mechanical aids, but also that it will, in fact, be necessary to utilize*

such personnel in many areas formerly considered beyond their ken if physicians and other such highly trained professionals are to be freed to realize their new potentials in ministering to health needs. Rigid definitions and regulations are, therefore, subject to speedy obsolescence both in terms of personnel capabilities and in terms of the needs of the system. One response to such definitions would of course be frequent resort to the legislature for modification. This, however, may entail great delays in making the necessary adjustments and might place the final judgement in a forum not in fact equipped with the expertise and experience which should underlie such a decision.[137]

Further, legislatures are subject to the vicissitudes spawned by political pressure groups.

An additional argument against licensure because of its inhibitory effect on manpower utilization is posed by the very concept of the physician's assistant. Ballenger points out that:

The physician's assistant functions in a personal relationship with the physician. Although the assistant receives a core of basic background knowledge and skills through participation in the formal training program, it is intended that his education should continue throughout his work experience under his physician's supervision. New skills would certainly be acquired over time and new understandings gained as the assistant becomes more familiar with the practice of his particular physician. A scope of practice specified for the recent program graduate might impose an unjustified ceiling on the graduate with a number of years' experience. Similarly, the skills taught one assistant by his employing physician might be very different from those taught another assistant whose employing physician practiced a different specialty or simply chose to use his assistant in another way. In other words, if defined by the sets of functions performed (scopes of practice), there could be as many types of physician's assistants as employing physicians. Training programs are even permitting a measure of concentration in particular areas, which may result in an assistant's having greater expertise in his area of concentration even at the time of graduation than do most of his contemporaries.

This diversity of experience and the consequent diversity in capability would pose a realistic definition of a scope of practice for physician's assistants.[138]

Because of the nature of physician's assistants, it would be impossible to license every type of assistant, or every new manpower category, without a proliferation of licenses resulting in the further fragmentation of health services delivery. This, as Ballenger states, is of particular concern to hospitals, where the various licensed interest groups can exert much the same influence as unions and may therefore have a substantial impact on personnel utilization.[139]

Ballenger states:

The jealous guarding of jurisdictional boundaries may culminate in the necessity for a health worker to have several licenses in order to perform in what is, in truth, a single profession.[140,141] *This may lead to increased costs for medical care if salary demands continue to increase in reflection of the additional formal training and concomitant expenses involved in securing the various licenses.*[142] *Keeping supply short through licensure in itself drives salaries up in a time of increasing demand such as this.*[143] *Although licensure laws do serve a function in measuring at least initial qualification, it can certainly be argued that the disadvantages of the current scheme outweigh the benefits in view of the other quality controls (such as program accreditation) which were not in existence when the licensure scheme originated.*[144]

Because of its restrictiveness licensure has an inhibitory effect on the mobility of health manpower. In the absence of reciprocity agreements or recognition of national certification, state licensure discourages geographic mobility of personnel. A proliferation of licensed categories, all with non-interchangeable academic requirements, as with the licensure of nurses, discourages vertical and horizontal mobility.

Colorado's Child Health Associate Law passed in 1969 illustrates many of the restrictive drawbacks of state licensure. It is a highly detailed licensure law for one type of physician's assistant, the child health associate. The act is administered by the state board of medical examiners. Section Two, Definitions read, in part, as follows:

(3) "Pediatrics" means that branch of medicine which deals with the child and its growth and development and with the care, treatment, and prevention of diseases, injuries, and defects of children.

(4) A "child health associate" is a person who, subject to the limitations provided by this act, practices pediatrics as an employee of and under the direction and supervision of a physician whose practice to a substantial extent is in pediatrics.[145]

The significant qualifications of the child health associate are: (1) completion of a course of study approved by the board in an accredited college or university and possesion of, at least, a bachelor's degree from such college or university, (2) completion of an internship of at least one year, and (3) completion of an examination covering the major aspects of pediatrics.[146]

The rigidity of the law is primarily manifest in Section Three, Limitations of Practice. Here the law states that only one associate may work for a physician at a given time, and that a group of physicians may hire one associate only per member. A child health associate shall practice "only in the professional office of the employing physician" and only during the time when the employing physician is "directly and personally available," except in emergencies. The associate may function outside the physician's office only when the physician is present or only when performing follow-up care pursuant to the specific direction of the physician related to that particular patient. An associate shall not perform any operation or cutting procedure or engage in the treatment of fractures.[147] A federal, state, county, or municipal agency may hire child health associates, but they must function as above.[148] Though the law clearly provides legal recognition for the new category, which will protect both physician and associate, and has the virtue of requiring continuing education, which will tend to enhance the quality of care, its restrictiveness is obvious. Because of the closeness of supervision required, the act will do little to alleviate the shortage of physicians or to extend health care to areas with few physicians, which are major purposes of physician's assistants. Further it restricts innovations in the use of pediatric assistants, particularly various ratios such as one physician to two or three assistants which might greatly increase productivity. And finally, it restricts the amount of health services which Colorado-trained pediatric nurse associates have demonstrated that paramedicals with special training can render (see below). Certainly child health associates with three years of intensive training in pediatrics,

at as outstanding an institution as the University of Colorado, will be equipped to equal the activities in pediatric care of pediatric nurse associates.[149]

It is significant that several national organizations oppose licensure as a means of legal recognition of physician's assistants. The AMA expressed its opposition at its 1970 convention in the same resolution which supported accreditation of physician's assistants training programs.[150] The American Society of Internal Medicine has voiced its opinion that the dependent nature of the assistant's role makes licensure neither necessary nor desirable.[151] The Board on Medicine of the National Academy of Sciences feels that the optimal utilization of physician's assistants demands a flexibility incompatible with licensure.[152]

(3) Establishment of a Board or Committee on Health Manpower Innovations

Another approach to the problem is the legislative establishment of a Board or Committee on Health Manpower Innovations which would be independent in function or responsible to the board of medical examiners. Such a committee could be interdisciplinary, composed of representatives of all health professions concerned with problems of manpower shortage and representatives of consumer groups. Any group wishing to develop a new manpower category or to expand delegations to an existing category would submit a written proposal to the committee for evaluation. The plan might receive tentative approval to begin, which would be followed by periodic evaluation over a period of years, before final approval. The recognition by a statutory committee of a new manpower category could legitimize the activities of that category much as Federal food and drug laws authorize the controlled experimentation with developmental drugs. This would protect physicians and assistants from civil liability and from criminal procedures while at the same time it provides for innovations, and protects the public. In making its final approval, the committee could coordinate its judgement with the experiences and judgements of other state or federal health manpower innovation agencies. A national board with representatives of state boards could contribute to nationwide uniformity of recognition of innovations. The greatest problem with such a proposal is probably its political feasibility at this time.[153,154]

(4) Exception Clause for Medical Practice Acts

Six states have enacted general exception clauses--Colorado, California, Florida, Arizona, Kansas, and Oklahoma. Each state amended its medical practice act to authorize delegation of functions. Oklahoma's exemption statute is typical of the six and provides that:

> *. . .(N)othing in this article shall be so construed as to prohibit. . .service rendered by a physician's trained assistant, a registered nurse, or a licensed practical nurse if such services be rendered under the direct supervision and control of a licensed physician.*[155-158]

An additional nine states are in the process of enacting similar legislation. While such statutes allow great flexibility, they afford ". . .only minimal protection for all concerned, as the guidelines are vague and there are apparently no formal checks."[159] Still, this type of law would prevent a finding of negligence per se and therefore has some value as an interim measure. Its effectiveness in terms of protecting both practitioner and patient might be enhanced by an additional requirement that a delegate be a graduate of an accredited training program.[160]

(5) Model Statute for the Regulation of Delegations

In October, 1969, and March, 1970, medical-legal conferences were held at Duke University to discuss the merits of various proposals for the legal recognition of physician's assistants. The approach agreed upon incorporates features of three proposals: licensure of users of physician's assistant;[161,162] promulgation of standards and regulations by the state board of medical examiners or by a committee on manpower innovations; and enactment of a general exception statute.[163] The proposal, which would become part of the medical practice act of a state, exempts:

> Any act, task or function performed by an assistant to a physician licensed by the Board of Medical Examiners, provided that
> (a) Such assistant is approved by the Board as one qualified by training or experience to function as an assistant to a physician, and
> (b) such act, task or function is performed at the direction and under the supervision of such physician, in accordance with rules and regulations promulgated by the Board.[164]

This type of statute would leave regulation of new manpower categories to the medical profession, with the control being exerted by both organized medicine, through the Board of Medical Examiners, and by the individual physician employer. The Board would regulate both the training and scope of practice of the

assistant and would retain the power to withdraw its approval of individuals who proved incompetent or who failed to follow the regulations.[165] The physician-employer would seek to avoid vicarious liability by making sure not only that his assistant performed his tasks competently, but also that he performs only those functions which fall within the regulations of the Board.[166] The Board would presumably be able to react faster than and with greater expertise than the legislature in preventing obsolescence and in recognizing valuable innovations.

This proposal would provide protection to both the patient and the professional, but without conceding a great deal of flexibility. Recognition by the board of a physician's assistant's previous experience as well as educational qualifications might permit greater vertical and horizontal mobility. Participation in a program of continuing education as a means of promoting increased quality of health services could easily be a condition for the Board's continuing approval of the assistant. The term "assistant to the physician" is meant to apply to no particular category but rather relates to a variety of assistants, from registered nurse to the informally trained person from the community.[167]

In conclusion, it is of interest that at least three states are now in the process of establishing legal recognition of physician's assistants.

D. Availability of Professional Liability Coverage

An important question for institutions and physicians who desire to use physician's assistants or nurse associates is the availability and cost of malpractice insurance coverage. The general concensus among those training and hiring nurse associates is that the acquisition of liability coverage is little problem. Nurses traditionally have gotten coverage when necessary and their traditionally broad licensure and participation in health care is an adequate precedent for expanded roles under physician supervision.

The problem is more complex for physician's assistants. Nevertheless, it appears that here again reasonable solutions are obtainable. A pilot survey, done by Howard at Duke University in 1969, of the 14 major professional liability carriers listed by the AMA, got positive responses from nine companies, with no response or deferred responses from five. A summary of some of the policy statements of the nine companies is as follows:

(1) Institutions and hospitals training physician's assistants may already have or can obtain coverage for the acts of students during their training.

(2) Graduate physician's assistants from university programs who are employed by a physician can obtain professional liability insurance from most companies at a rate approximately fifty percent of the rate paid by their physician employer.

(3) Physicians employing graduate physician's assistants can, for a very low rate, obtain insurance protection for acts of the assistant.

(4) Hospitals that utilize the services of physician's assistants employed by a physician may already have or can obtain protection against negligent acts of the assistant while on their premises.[168]

A next step might be for the National Insurance Council to formulate a policy for physician's assistants.

Whatever the coverage which is available for physician's assistants in the near future, that too must be subject to the major changes in the procedures of professional liability coverage and litigation which must occur to counteract the deleterious effect of current practices on health services. Premiums are becoming prohibitive in many highly populated areas, and, certainly, settlements in the U. S. are generally unheard of elsewhere in the world, as some of the cases presented at the 1970 World Medical-Legal Conference quickly attest. One way might be for health service delivery systems to require mandatory but fair arbitration of tort claims by an interdisciplinary body with consumer representation as a condition for entry into the system. This is done to some degree in certain systems. At any rate, there is some middle ground which will insure justice to both plaintiff and defendant, yet will not inhibit the delivery of health services.

VII. EVALUATION

In a health care system with limited resources, with particular standards of quality to maintain or to develop, and with many options available to it, if a new and expensive method or agent to deliver care is planned, or if the expansion of a traditional method of care or traditional manpower category is proposed, those administratively responsible for the system must weigh, very carefully, the total impact upon the system of that innovation or replication. In this frame of reference, the cost to the system, in terms of overall productivity of the new approach, or expanded traditional approach, must be calculated not only in terms of the resources available, but also in terms of its effect on standards of quality of care.

A. Quality

The quality of health services is a multifaceted concept that might best be viewed on a continuum with technical quality, the procedural, observational and decision making aspects of care at one end; continuity, efficiency, and comprehensiveness of care somewhere in the middle; and, at the other end, the state of well-being of a system that, in terms of all the other quality factors, functions to achieve ". . .the highest level of health attainable for every person. . ." with a high degree of consumer satisfaction. In actuality, however, many of the facets of quality intertwine.

It is the quality of care which is probably most important to physicians, and, with respect to the quality of care rendered by physician's assistants or nurse associates, it is physicians who are the ultimate regulators of quality. The physician knows the capabilities of his assistant or associate, supervises his or her work, and, must be the one ultimately satisfied. If unsatisfied, the physician can adjust his practice for a time in which he can give the assistant the particular training necessary to attain a preset standard of quality.

Silver has conducted a study of the procedural quality of pediatric nurse associates. In the study, the nurse associates would see the patient shortly before the physician. The study showed that for 280 "conditions," ranging from a well child to various degrees of illness, the physician and nurse associate were in agreement in 82 percent of cases; there was an insignificant difference in interpretation in 17 percent of cases; and there was a significant difference in interpretation in only 0.7 percent (two) of the cases. In one of those two situations, the nurse thought the child had an inflamed throat; and the doctor diagnosed pneumonitis. In the other, the nurse also found an inflamed throat; several hours later the doctor diagnosed meningitis, but the cerebrospinal fluid was entirely normal, however, and subsequently, the nurse proved correct.[169]

Rogers, et. al., have shown that the use of non-physician personnel increased the effectiveness of the physician and expanded the scope of services beyond that usually provided by a general practice. Rogers' program, using allied health professionals with greater than normal responsibilities and with appropriate delegation, constituted a practical way to deliver primary health care which was well accepted by patients, simple in organization, comprehensive in scope, and was not costly.[170]

Bates recently pointed out that nurses have a traditional role of "caring" for patients and a traditional interest in the total psychosocial and health educational aspects of patient care.[171] She suggested that when nurses with these sensitivities are endowed with extra training and broader responsibilities, they contribute to an increased continuity, efficiency, and comprehensiveness of care with increased patient satisfaction, as the controlled studies of Lewis[172,173] and Davis[174] have shown.

Studies at Colorado and time-motion studies at Duke, which will be discussed later, have shown that pediatric nurse associates and physician's assistants, on a one to one basis, assistant to physician, have saved the physician 33[175] to 43[176] percent of his time previously spent in routine work. Such time saved would then be available for increased attention to more difficult cases, for preventive medicine or for continuing education, all of which increase the quality of care. The time could also be used for increasing productivity by seeing more patients. These advantages of using physician's assistants or nurse associates were, in part, actually demonstrated in the Pondy study.

B. Acceptability

Any system involved in the delivery of care, be it university medical center, prepaid group practice, public health department, fee-for-service group practice, or solo private practice, if it intends to use a new manpower category, or other innovations, for that matter, should be concerned about the acceptability of that new category by physicians in the system, by patients, and by other allied health personnel. Acceptance is important because it is integrally related to quality and to productivity. If a physician accepts a well-trained assistant for his ability, he will allow that assistant to make his own positive contribution to quality and productivity. Patient acceptance, with a conscientious, able and concerned assistant, will lead to patient cooperation and satisfaction. Acceptance by other allied health personnel will contribute to harmony and efficiency within the health system that in itself promotes increased quality and productivity.

To be fully effective, new manpower categories must have:

(1) Physician Acceptance

Many studies have shown that physicians not only accept the concept of assistants to the physician but also that many physicians already use such personnel on an informal basis. Beasley's survey of physicians in the 32 counties of the eastern third of Kentucky showed that an average of 68 percent approved of trained assistants taking histories, doing parts of physical examinations, taking an active part in therapy, treating patients in the physician's absence according to a preset protocol, and performing certain obstetrical procedures. He further showed an average of 31 percent of respondents already delegated such tasks to assistants.[177] Coyne and Hansen's survey of practicing physicians in Wisconsin showed that 61 percent of respondents believe that assistants are needed and 42 percent stated that they would use them in their practice. In projecting this data, the authors estimated that approximately 2,000 physicians in Wisconsin would employ "doctor's assistants."[178] Yankauer and Connelly's survey of pediatric practice in the United States showed that nurses, in all types of practice arrangements, performed services that could be more appropriately carried out by technicians and aides.[179] It also showed that, depending upon the task, 20 to 90 percent of pediatricians favored delegation of 15 representative office patient care tasks to an "allied health worker with appropriate special training." The tasks ranged from child care education for the parents to examination of a sick child. The study also showed that from five to 55 percent of pediatricians already delegated those tasks and that fifty percent of pediatricians feel that the major obstacle to the greater use of allied health workers in pediatric practice is the "lack of trained workers." Finally, 2,662 pediatricians stated that they would hire an "allied health worker with appropriate training," either full-time or part-time.[180] This response, when added to the 2,000 Wisconsin physicians, reflects not only the current acceptance of the concept of physician's assistants and nurse associates, but also the need and demand for those manpower categories.

(2) Patient Acceptance

Other studies have shown not only that patients accept care from physician's assistants and nurse associates with special training and primary care responsibilities, but also that they might prefer the care provided by the combination of physician and nurse or assistant. Patterson and Bergman showed that in private, group health, and public clinic pediatrics, 76 percent of parents said they would approve of registered nurses, corpsmen, or licensed practical nurses, all with special training, providing care for their infants and children. Parents in private pediatrics

were the least, 70 percent, receptive. The survey also showed that 94 percent of the parents were "willing to try."

Silver and Lewis showed that in a private practice which served middle class patients and which used a Colorado trained pediatric nurse associate, 94 percent of the parents expressed satisfaction with the services of the pediatrician-nurse associate combination, and 57 percent stated that the joint care was better than that of the pediatrician alone. Parents were particularly satisfied with the home visits which the nurse associate made. Over 90 percent considered the physician-nurse associate combination to be desirable and inevitable.[182]

Pondy, et. al., did a study of patient acceptance of the physician assistant. The group used 72 patients from physicians who employed Duke trained physician assistants in their practices. One practice setting had mostly public patients, two had mostly private patients, and one was a community general practice clinic. The group found a strongly positive correlation between acceptance and number of years of formal education. Acceptance was curvilinearly related to income; it was greatest for the middle income ranges ($5,000 - $8,000) and less for lower and high income patients. The greatest patient acceptance, of the four practice settings, was in the community general practice clinic. This, however, was significant only at the ten percent level.[183]

There is also much anecdotal data about patient acceptance of physician's assistants and nurse associates. It is generally felt that patients accept the assistant or associate if the physician adequately explains his role and if the patient recognizes that the assistant is being supervised by the physician. Nevertheless, since acceptance of care is so important for optimal delivery of care, and since studies have shown a differential acceptance of physician's assistants and nurse associates related to socio-economic factors, the education of the consumer service population must receive continued study.

(3) Acceptance by Other Allied Health Personnel

Of equal importance, for harmony and efficiency within the health care system which uses them, is the acceptance of physician's assistants and nurse associates by other allied health personnel. Breyspraak and Pondy, in an interesting, though small, study of the role relations of physician's assistants in a hospital, suggested that the self-acceptance and satisfaction of the assistant was greatest when he was actually functioning as an "assistant to the physician," carrying out unique functions distinct from those of other paramedical personnel and congruent with the ideals of his training. They further concluded that acceptance by other allied health workers was likely to be higher if the assistant performed a set of

tasks that visibly helped them in their own work, for example serving as a liaison with the physician, communicating information about a patient's care, or performing laboratory analysis. In short, other allied health professionals were most accepting when they understood the assistant's role and saw how it helped them in the overall delivery of care. The largest single group questioned about the physician's assistants in the study was nurses. [184]

Nurses may well be the profession most concerned about physician's assistants[185] and expanded roles of nurses as associates of the physician.[186] If this is true, it will be important, particularly in large care institutions, that the roles of assistants to the physician are adequately explained to nurses and other personnel. This problem may not be as great in smaller practice settings. Hopefully, collaborative relationships between medicine and nursing will continue and grow as they have between the AAP and the ANA and NLN involving pediatric nurse associate programs. Dr. Dorothy Mereness, Dean of Nursing at the University of Pennsylvania, recognizing that the traditional patterns of health service are changing and must change, called on professional nursing to accept larger and more significant responsibilities in the future in order to meet the nation's health needs. Dr. Mereness anticipated that ". . .many graduate nurses will be interested in (aligning) themselves (with) (a physician) and accepting whatever extra training he may deem necessary in order to fill this new role. ..."[187]

Given the complexity of the interrelationships among physicians, nurses and other allied health personnel, which Bates recently described,[188] and multiply that by the relationships of agents of care and the patient, it is easy to recognize that those planning new systems of care will have to give great attention not only to those traditional interrelationships but also to new interrelationships, especially when they occur so close to the physician-patient interface as with physician's assistants and nurse associates. It is here that medical schools, to name but one professional educational institution, might look with interest on certain aspects of dental education. All dental schools teach the dental student how to work with assistants in order to achieve the greatest efficiency and productivity.

C. Productivity

In terms of productivity, the use of physician's assistants or nurse associates is particularly applicable to pediatrics. Bergman has shown that 48 percent of a pediatrician's time is spent in patient care, 12.5 percent on the phone, and nine percent on paper work. Of the time spent in patient care, 50

percent is in well-child care and another 22 percent is with children with minor upper respiratory infections.[189] In actual practice, pediatric nurse associates are able to do most of pediatric care. Silver's group at Colorado has shown that in a clinic in a low income neighborhood, which has a physician in attendance only one-half day each week, the pediatric nurse associate was able to manage 82 percent of the 2,735 patient visits studied. She managed 71 percent of the visits alone. In 11 percent she merely needed to consult with a physician by phone. Thus, in less than one-fourth of all visits was it necessary for the nurse to refer the child elsewhere for medical services.[190] Schiff has shown that after a pediatric nurse associate joined the private practice of two pediatricians, there was an 18.8 percent increase in patient visits.[191] It is quite possible that using different ratios, such as three pediatric nurse associates to one pediatrician, will achieve even greater productivity.

Pondy, with "before" and "after" time-motion studies, has shown a significant amount of time saved after a Duke-trained physician's assistant joined a private practice in Ayden, North Carolina. The assistant saved the physician 43 percent of time formerly spent in routine tasks. This time saved, and the extra help from the assistant enabled the pair to devote 16 percent more time to the average patient and 36 percent more time to significant new illnesses. There was also increased output of preventive care in that 13 times as many work-ups were carried out by the team than by the physician alone.[192]

The time-motion studies of the Washington MEDEX program, which will provide data on 14 separate practices, will, very likely, show similar time savings and increased productivity.

D. Cost

Little national data is yet available about the cost to train a physician's assistant or pediatric nurse associate. One estimate from the pediatric nurse associate program at the University of Virginia is $2,500 per student based on dividing the number of students by the total cost of the program, including the student stipends. Other estimates range from $1,000 to $3,000 per pediatric nurse associate.

The AAP in its guidelines for training pediatric nurse associates suggested that the program "...should not necessarily depend on student tuition fees."[193] There is, also, some thought that if programs do charge tuition, a bias in applicants might

result by self-selection because of tuition that could result in a decreased tendency for graduates to work in areas of greatest need. Yankauer's group is now studying this proposition.

Those at Duke University estimate that the cost of training a physician's assistant is about the same amount per year as the training of a medical student.[194] This is reasonable because the teaching techniques, and much of the clinical curriculum, are quite similar, and the faculty is the same. The major difference is that in terms of overall education it takes much less time to train a physician's assistant than a practicing physician. But, here again, productivity and quality must be considered.

The actual training cost in the MEDEX programs is probably quite similar to that at Duke, and may even be less, because much of the training takes place in the office of the preceptor and not in a teaching hospital. The great cost of the MEDEX program, in terms of the physician's assistants produced, is due to the cost of the ongoing evaluation efforts, such as time-motion studies of all Medex-physician practice settings before and after the Medex joins the practice, and cost analysis, for objective data, and evaluation of quality by consulting teams, for subjective data.

The salary of physician's assistants and nurse associates is of equal importance with the training cost in that it is the ongoing expense that health care delivery systems, hospital or private physician, will have to bear. Fuchs et.al., recently presented a comparison of the health industry and a "typical" industry, generated from data about 20 industries, in terms of the wages which various percentages of the personnel in the industries earned. Fuchs showed that only 10 percent of personnel in the health industry earned the mean wage for the health industry, compared with approximately 22 percent in the "typical" industry. Also, only 7.7 percent in the health industry earned a salary 50 percent above the mean, compared with 26.7 percent in the "typical" industry. Most personnel in the health industry earn a wage well below the mean wage, and very few, compared with other industries, earn the $10,000 to $15,000 per year that their education, experience and productivity might justify.[195] There is essentially little middle management personnel in the health industry, and, without comparable salaries, there is little hope of attracting enough career individuals in the middle professional and supervisory functions. It is with this background that those training physician's assistants and nurse associates anticipate that these categories should earn from $8,000 to $12,000 per year.[197] The thought is, because of the professional ability and administrative functions of physician's assistants and nurse associates, and, in the hope of retaining

them as career personnel, that they should receive a middle management wage.

Considerable headway has been made in this area, particularly for physician's assistants. For example, Duke University has recently obtained executive, administrative and professional exemptions, under Federal wage and hour law, for its physician's assistants involved in teaching, clinical, and administrative duties. This will enable the assistants to get a salary commensurate with their productivity and will allow them to work the extra hours that their jobs demand.

The U.S. Civil Service Commission, working closely with the Veterans Administration and other Federal agencies, has recently published a series definition for the physician's assistant occupation and qualification standards defining the experience and education requirements for employment and advancement in this occupation under the Civil Service pay system.

Under these Civil Service guidelines, graduates of most physician's assistant programs can be employed at the GS-7 pay level (about $8500 per year) and advance with job experience to the GS-11 level (maximum over $16,000 per year).

This pay schedule is particularly significant in that it may contribute to the standardization of salaries for Physician's Assistants.

The salaries for pediatric nurse associates have generally been somewhat lower. Many feel that they, because of their productivity, should earn from $8,000 to $12,000 per year. Schiff has already shown that in a private practice the work of a pediatric nurse associate at the prevailing fee-for-service, generated $16,800 in a year, with no increase in overhead, and with an 18.8 percent increase in total patient visits. The nurse associate was paid less than $8,000 for that year.[199] With the AMA's position that nurse associates could participate in the fee-for-service system[200] a case could be made for higher salaries if such figures prove to be the usual occurrence.

VIII. QUESTIONS AND POTENTIAL

The ultimate potential of physician's assistants and nurse associates is yet to be determined. The indications are that it is great enough to warrant the funding necessary for large scale demonstration and thorough evaluation, if not the actual replication of certain programs with the intent of expanding the ranks of certain manpower categories.

The question of legal recognition of physician's assistants remains unclear in most localities even though efforts are being made in some areas of the country. The question may be ultimately resolved in nationwide reforms of all health manpower licensure and certification mechanisms. Two medical-legal authorities have already presented a study with recommendations on licensure of health manpower to the Assistant Secretary for Health and Scientific Affairs of DHEW which may be the nidus from which future studies and reforms arise. Current pending Federal allied health legislation calls for a report identifying the major problems associated with licensure, certification, and other qualifications for practice or employment of health personnel which shall include specific recommendations.[201] Even if such legislation is not enacted now, the interest is present and will remain until a future date.

Of major importance is the potential effect of physician's assistants and nurse associates on the redistribution of primary care physicians. Will the help of an assistant or nurse associate encourage beleaguered physicians to gravitate to those areas? Incentives such as the availability of adequate assistance will be necessary to encourage the growing trend toward the involvement of physicians in community health activities in areas where health services are few.[202] Or, will health administrators, through lack of incentives for physicians to relocate, allow the use of assistants and associates to accentuate the current maldistribution of health services? It must be remembered that as long as assistants and associates are dependent upon physicians, physicians must be present. With the ability and increased productivity provided by physician's assistants or nurse associates, however, high productivity and quality can be maintained with fewer physicians.

And finally, in those areas where no physician is available, it will be the responsibility of health service delivery systems to provide care, both primary and otherwise. That care may best come from a physician's assistant or nurse associate linked with a medical center by tele-communications as elaborate as image transmission and with recourse to air transportation in emergencies.

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